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Plant protein disulfide isomerases

Description of Technology: This invention is in the field of plant molecular biology. More specifically, this invention pertains to nucleic acid fragments encoding protein disulfide isomerases in plants and seeds.

Patent Listing:

1. **US Patent No. 6,864,403**, Issued March 8, 2006, "Plant protein disulfide isomerases"
   http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6864403

Market Potential: Protein folding requires the assistance of folding helpers in vivo. The formation or isomerization of disulfide bonds in proteins is a slow process requiring catalysis. In nascent polypeptide chains the cysteine residues are in the thiol form. The formation of the disulfide bonds usually occurs simultaneously with the folding of the polypeptide, in the endoplasmic reticulum of eukaryotes or in the periplasm of Gram-negative bacteria. Cells contain three types of accessory proteins that function to assist polypeptides in folding to their native conformations: protein disulfide isomerases, propyl cis-trans isomerases, and molecular chaperones.

Protein disulfide isomerases have been described in alfalfa (2 genes and one probable PDI P5 homolog), barley (2 genes, and one probable PDI PS homolog), maize, wheat, tobacco, and castor bean. In addition, based on sequence similarity to other known PDIs, two putative protein disulfide isomerases have been identified in Arabidopsis. Included in this application are corn, and soybean ESTs with sequence similarities to protein disulfide isomerase precursor. The corn sequences included share no similarity with the known maize PDI. Also included are corn, balsam pear, soybean, and the wheat ESTs with sequence similarities to RB60. Presently there are no plant RB60-homologs in the public domain. Overexpression of any of these PDIs together with another foreign protein will result in an increased yield of secreted, active foreign protein due to proper folding of the foreign protein.

Benefits:

- Greater expression of a secreted, active foreign protein

Applications:

- Plant molecular biology

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